

Droege Modifications and Noise Characteristics.

Four high voltage Droege power supplies were modified according to steps (1) and (2) of NuMI-NOTE-ELEC-0942, *Modification of Droege HV Supplies for Ethernet Control of the Beam Monitoring Ion Chambers*. The modified version has a more limited (0-1kV) range, but appears to have less AC noise when used in conjunction with FLARE purity monitor electronics than the unmodified version.

The University-of-Indiana-made purity monitor HV supply and amplifier has some high-pass signal conditioning for the HV signal. This removes much of the AC noise on the HV signal. When this capability is disabled, high-frequency noise from the Droege becomes more apparent.

We observed the cathode signal output of the University of Indiana purity monitor electronics when powered by the unmodified and modified Droege supplies. The table below outlines what was examined.

HV Conditioning	Droege HV Supply	Voltage	Timescale*	Figure
ON	UNMODIFIED	5kV	10 ms	Fig. 1
			40 us	Fig. 2
	MODIFIED	1kV	10 ms	Fig..3
		OFF	10 ms	Fig. 4
OFF	UNMODIFIED			
		5kV	40 us	Fig. 5
			10 ms	Fig. 6
		2kV	40 us	Fig. 7
			10 ms	Fig. 8
		500V	40 us	Fig. 9
	MODIFIED		10 ms	Fig. 10
		1kV	40 us	Fig. 11
			10 ms	Fig. 12
		500V	40 us	Fig. 13
			10 ms	Fig. 14
		100V	40 us	Fig. 15
			10 ms	Fig. 16
		OFF	40 us	Fig. 17
			10 ms	Fig. 18
	*All measurement on the 10 ms timescale were averaged to remove high frequency noise; measurements on the 40 us timescale were not.			

Overall, the modified Droege provides a more ideal DC HV signal than the unmodified one.

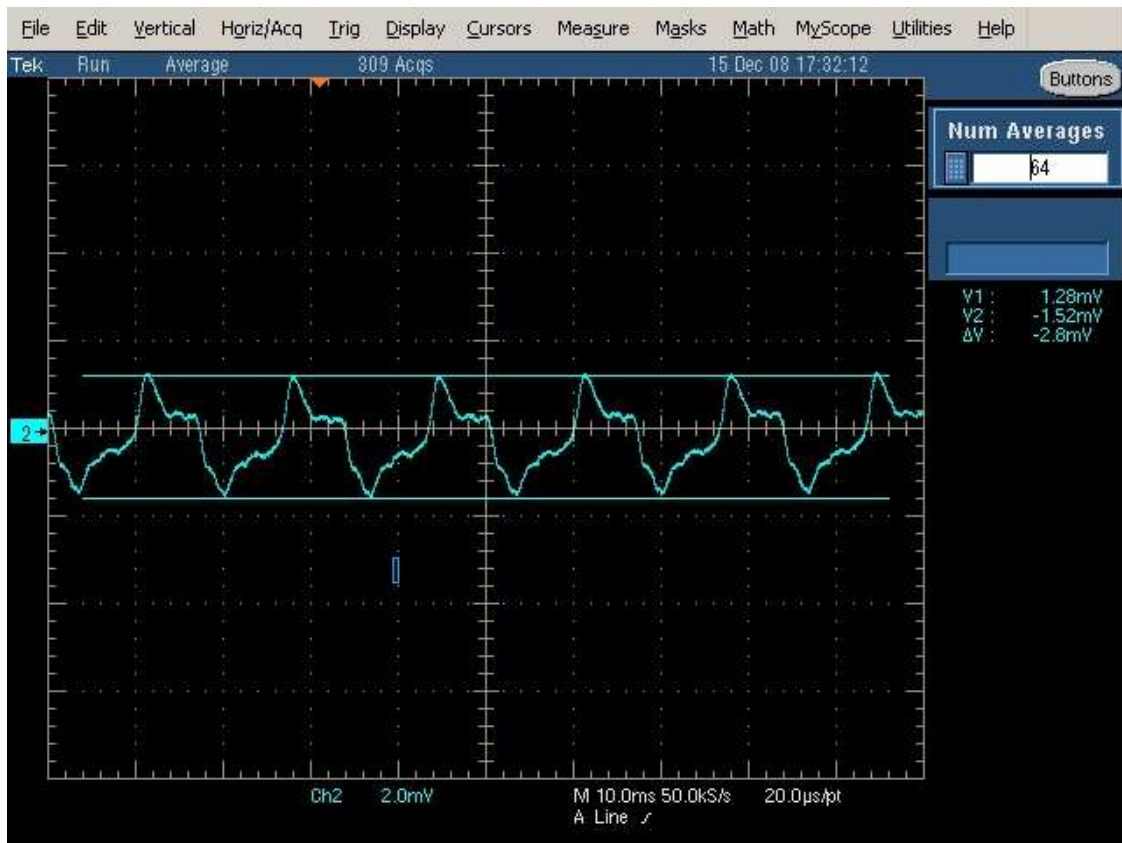


Fig. 1: Output of PrM electronics with HV conditioning when powered by unmodified Droege at 5kV.

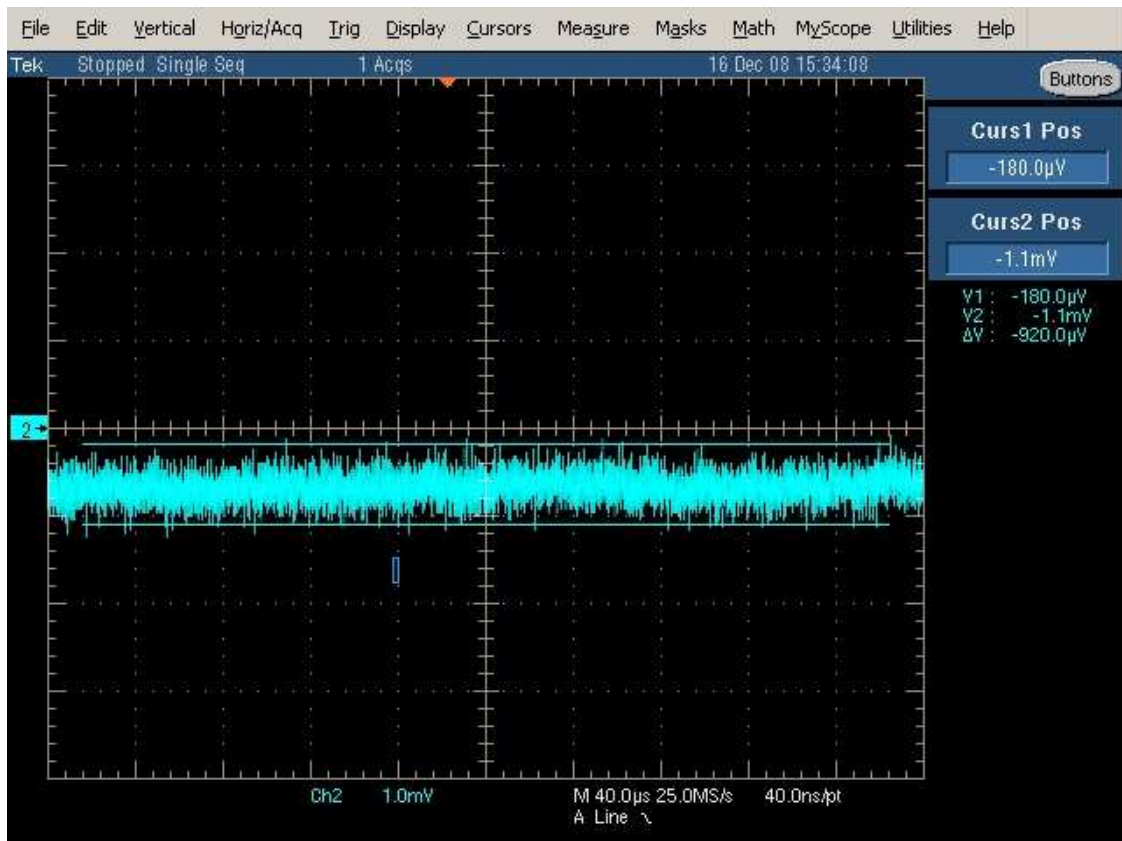


Fig. 2: Output of PrM electronics with HV conditioning when powered by unmodified Droege at 5kV.

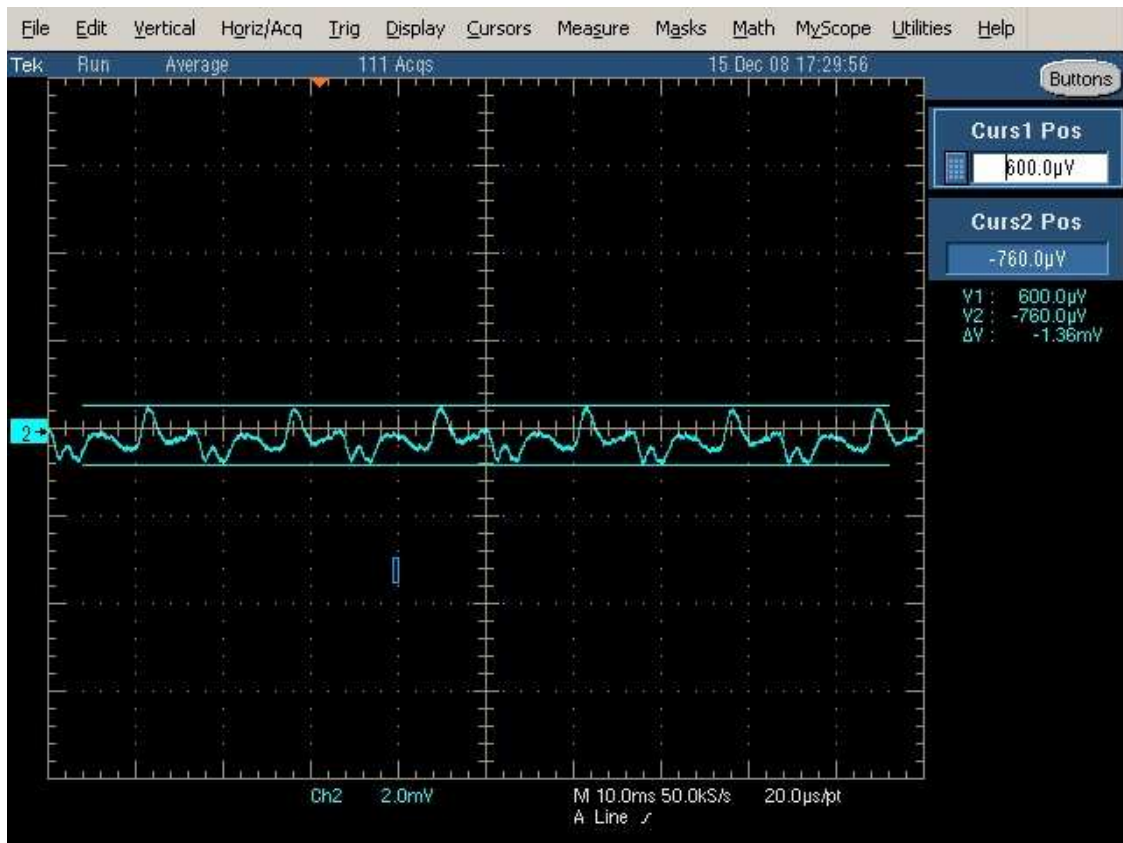


Fig. 3: Output of PrM electronics with HV conditioning when powered by modified Droege at 1kV.

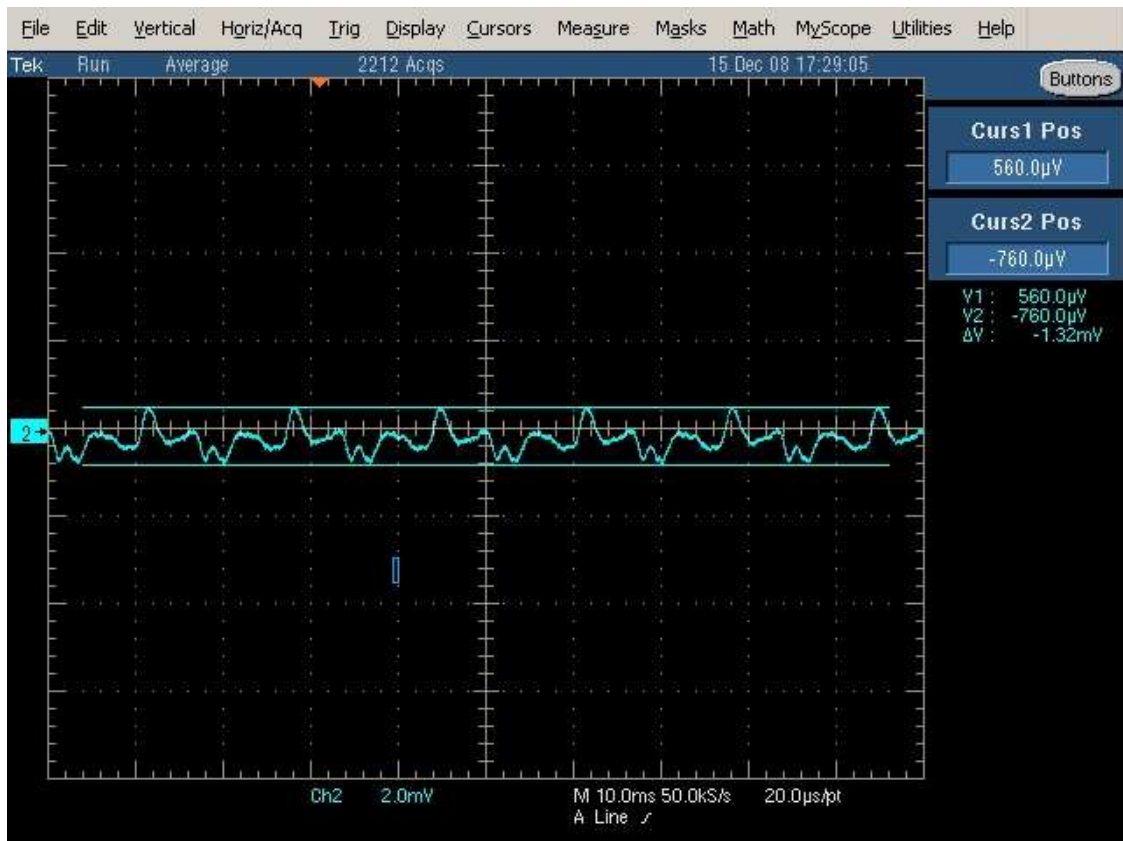


Fig. 4: Output of PrM electronics with HV conditioning when powered by modified Droege switched OFF.

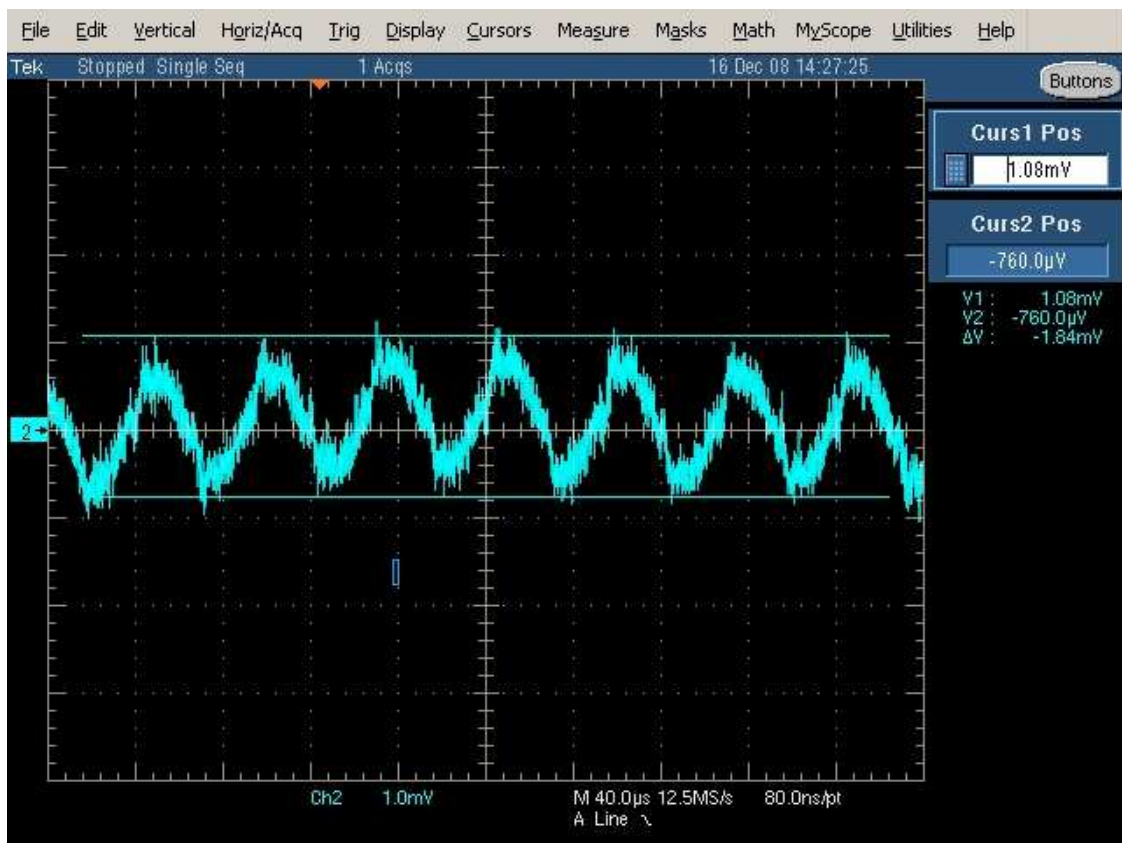


Fig. 5: Output of PrM electronics without HV conditioning when powered by unmodified Droege at 5kV.

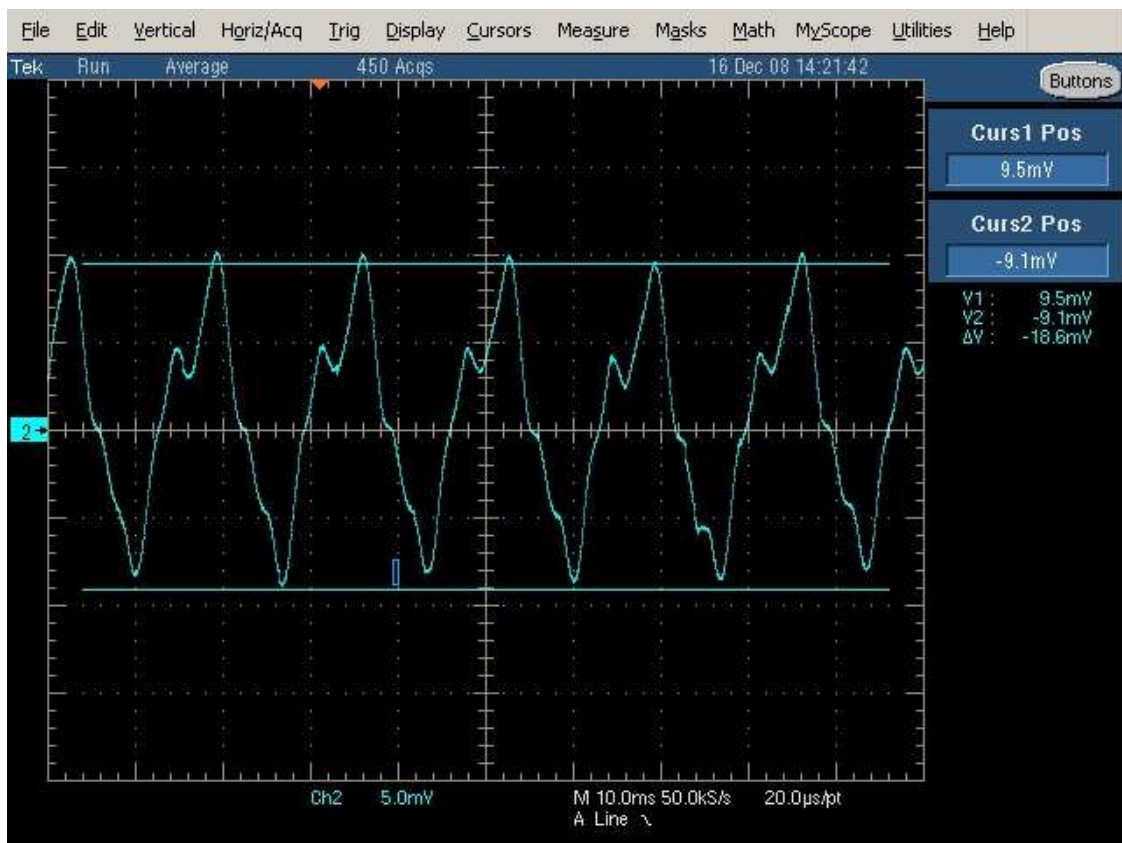


Fig. 6: Output of PrM electronics without HV conditioning when powered by unmodified Droege at 5kV.

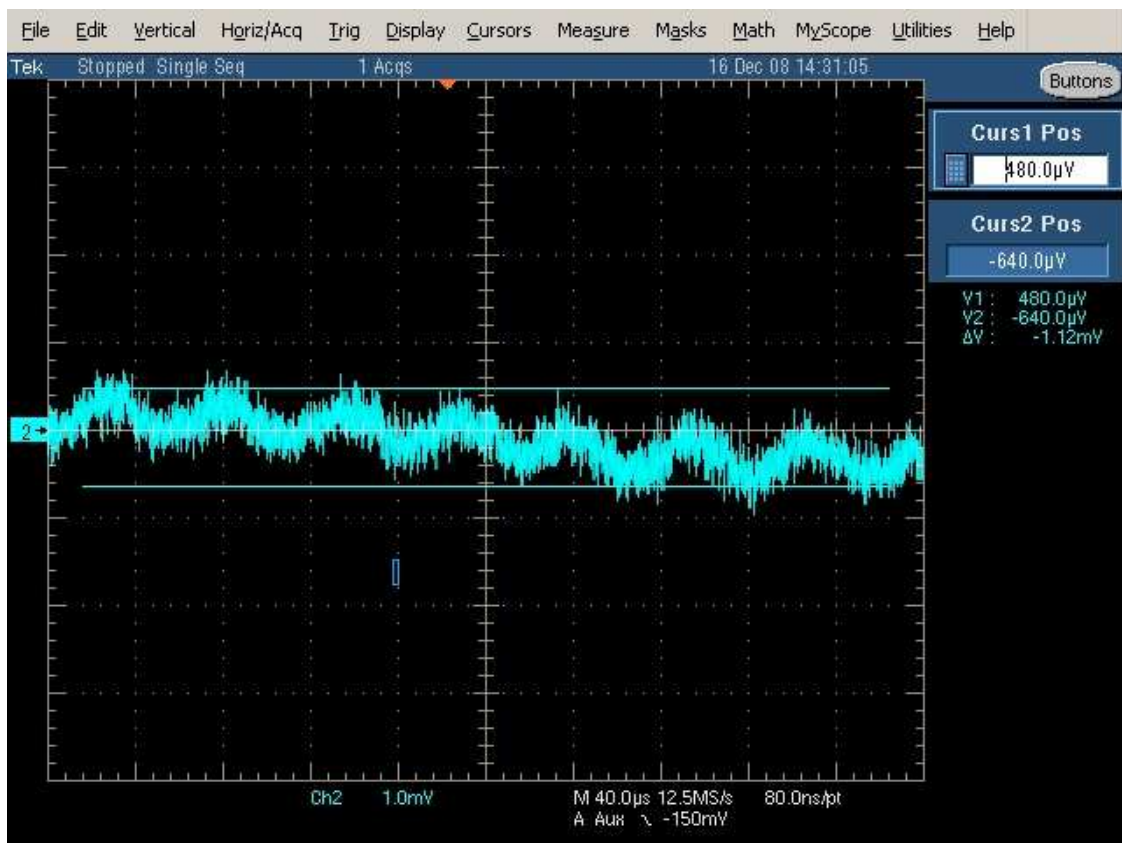


Fig. 7: Output of PrM electronics without HV conditioning when powered by unmodified Droege at 2kV.

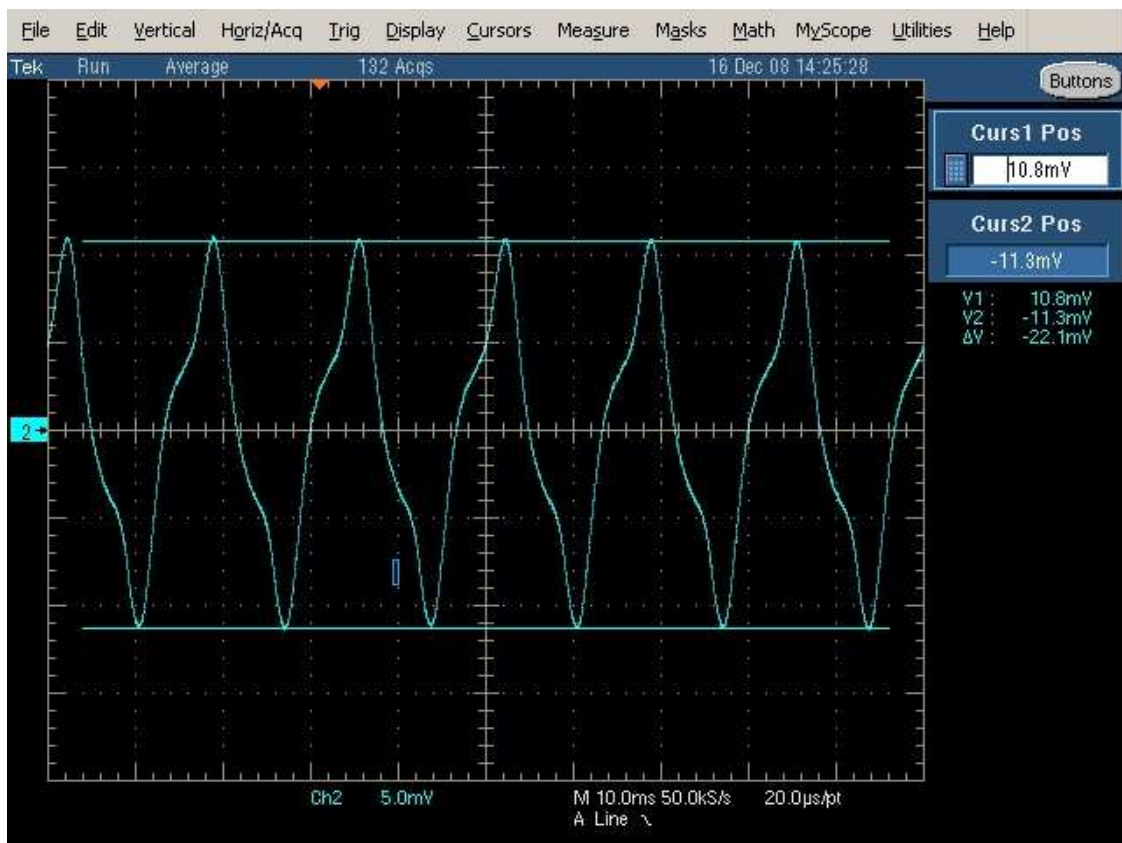


Fig. 8: Output of PrM electronics without HV conditioning when powered by unmodified Droege at 2kV.

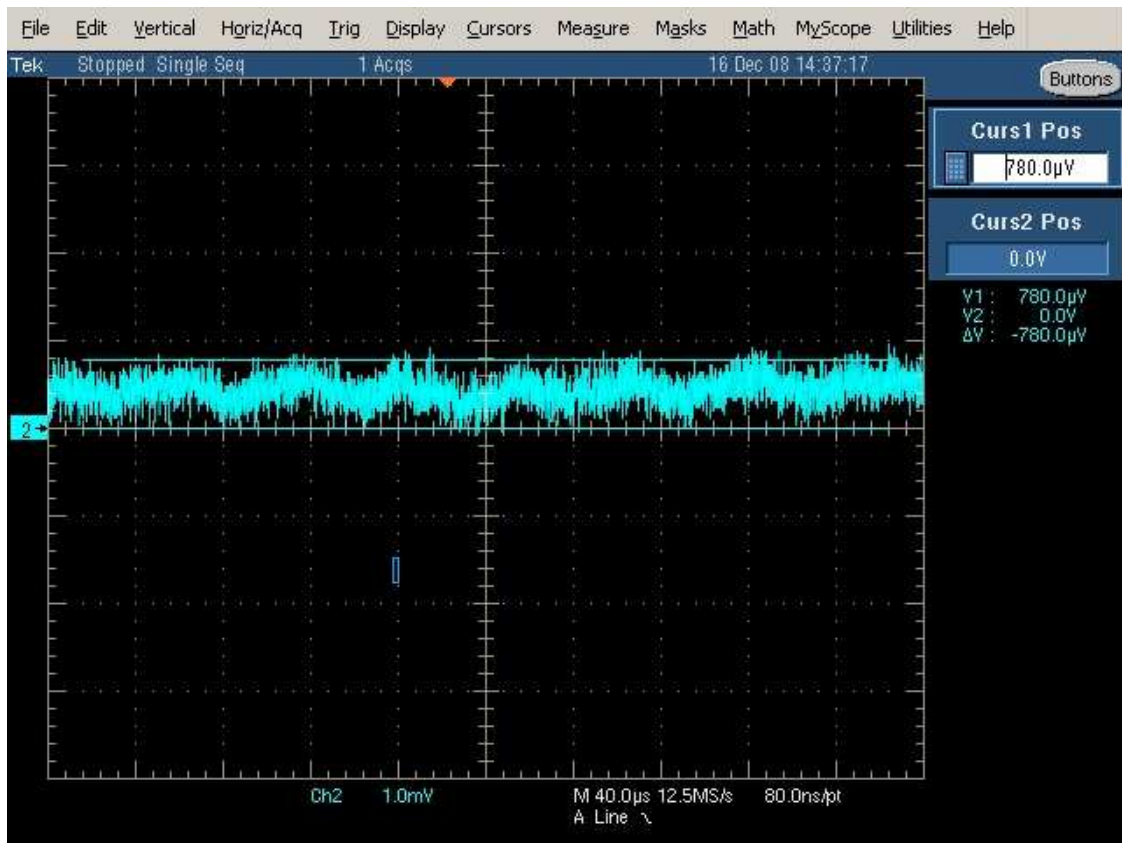


Fig. 9: Output of PrM electronics without HV conditioning when powered by unmodified Droege at 500V.

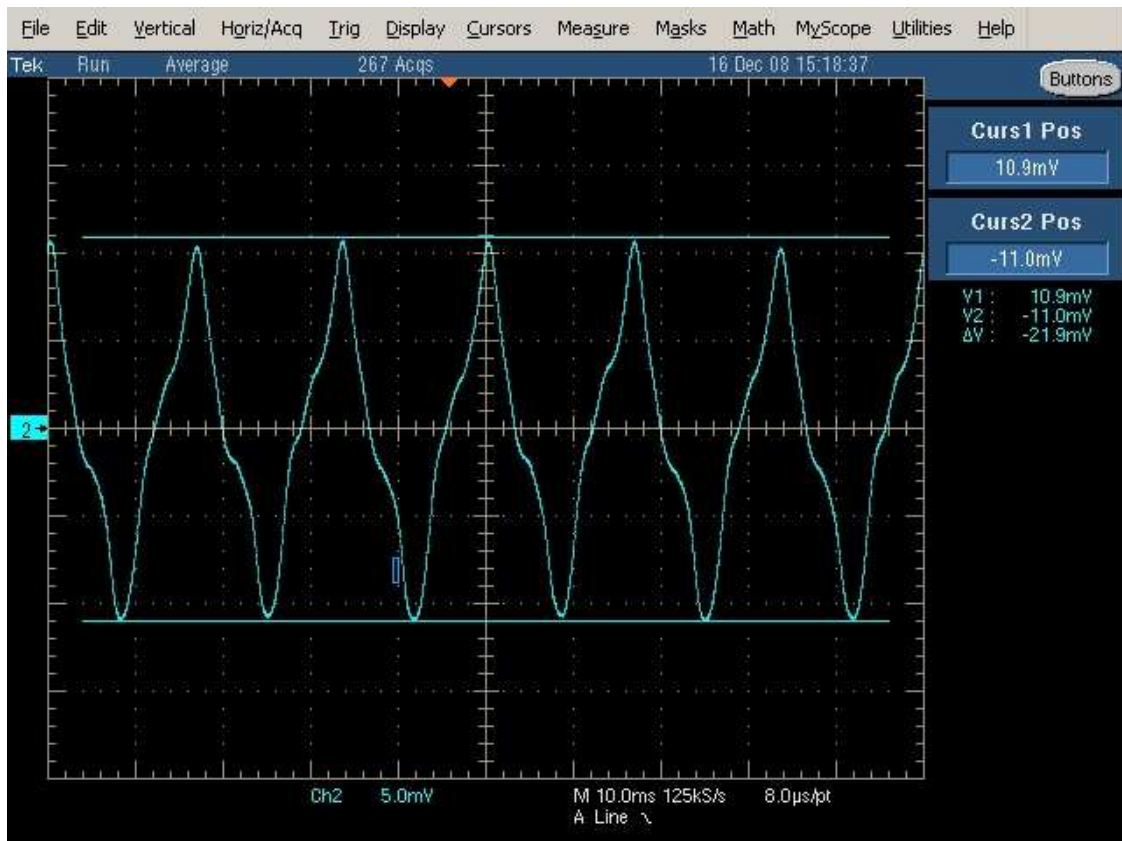


Fig. 10: Output of PrM electronics without HV conditioning when powered by unmodified Droege at 500V.

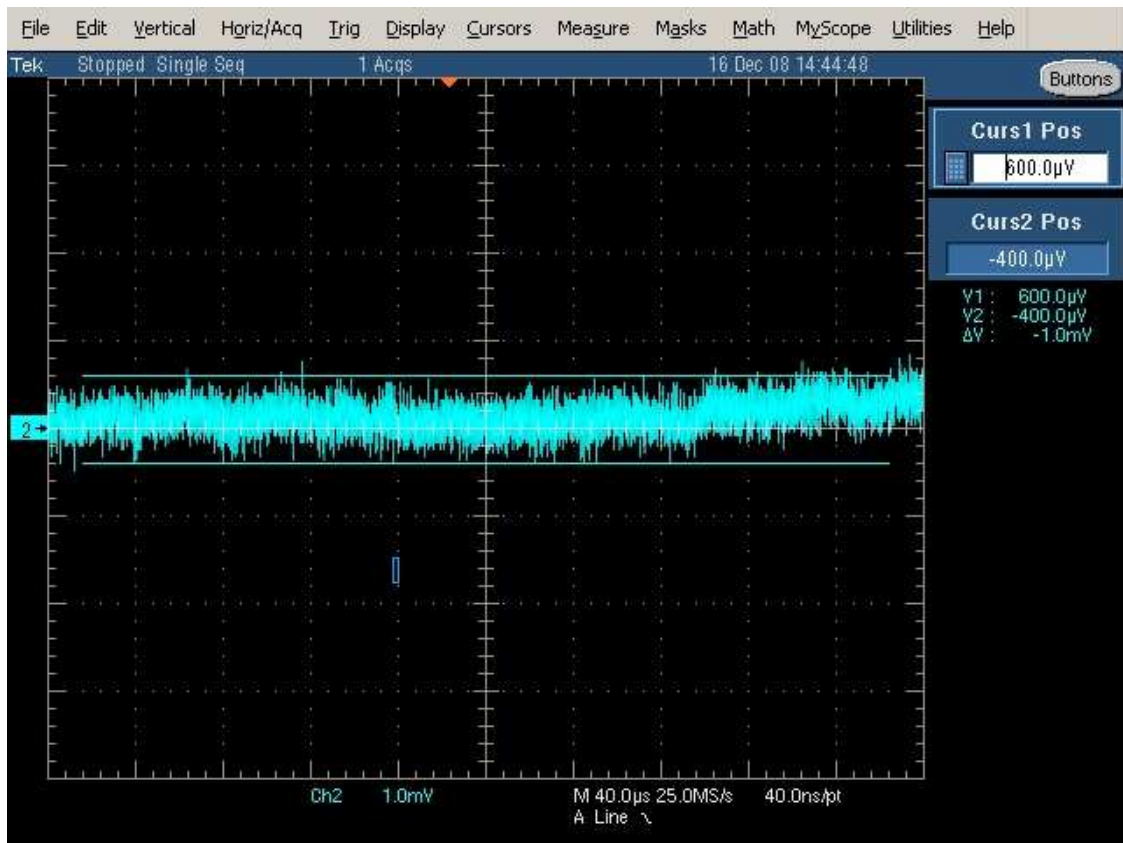


Fig. 11: Output of PrM electronics without HV conditioning when powered by modified Droege at 1kV.

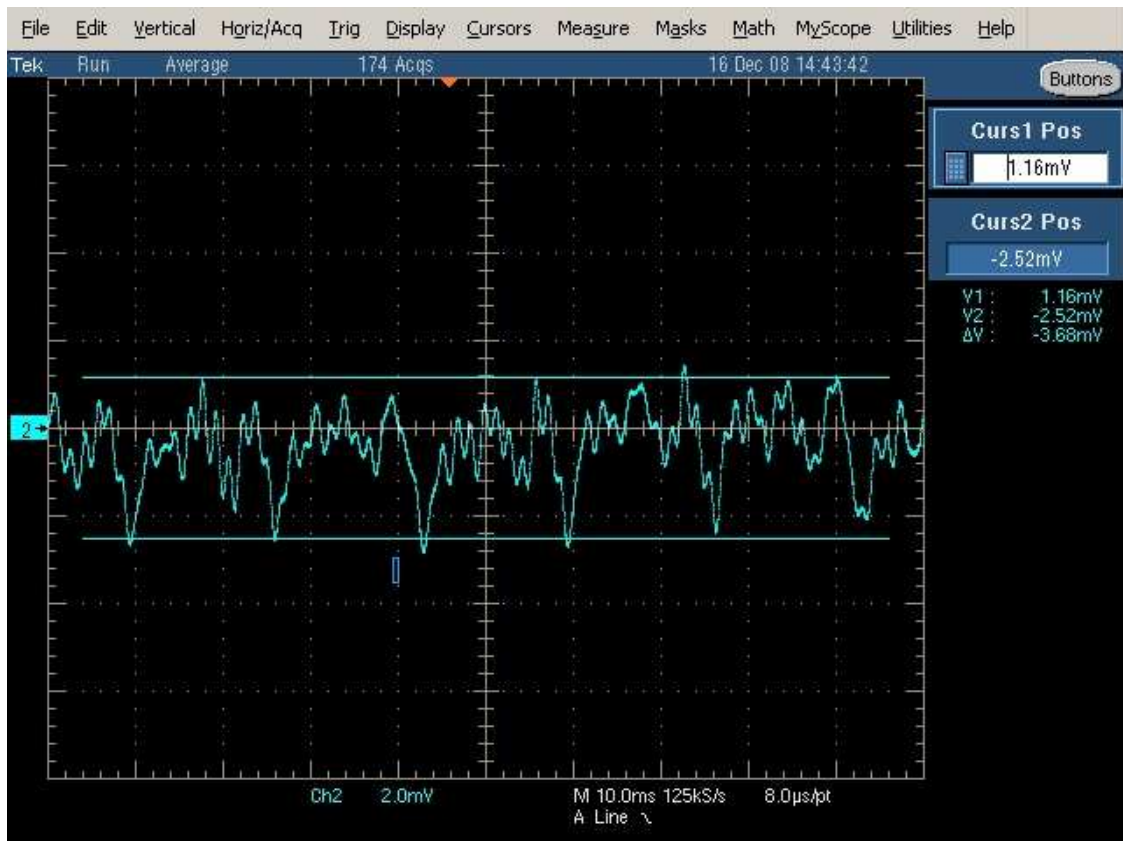


Fig. 12: Output of PrM electronics without HV conditioning when powered by modified Droege at 1kV.

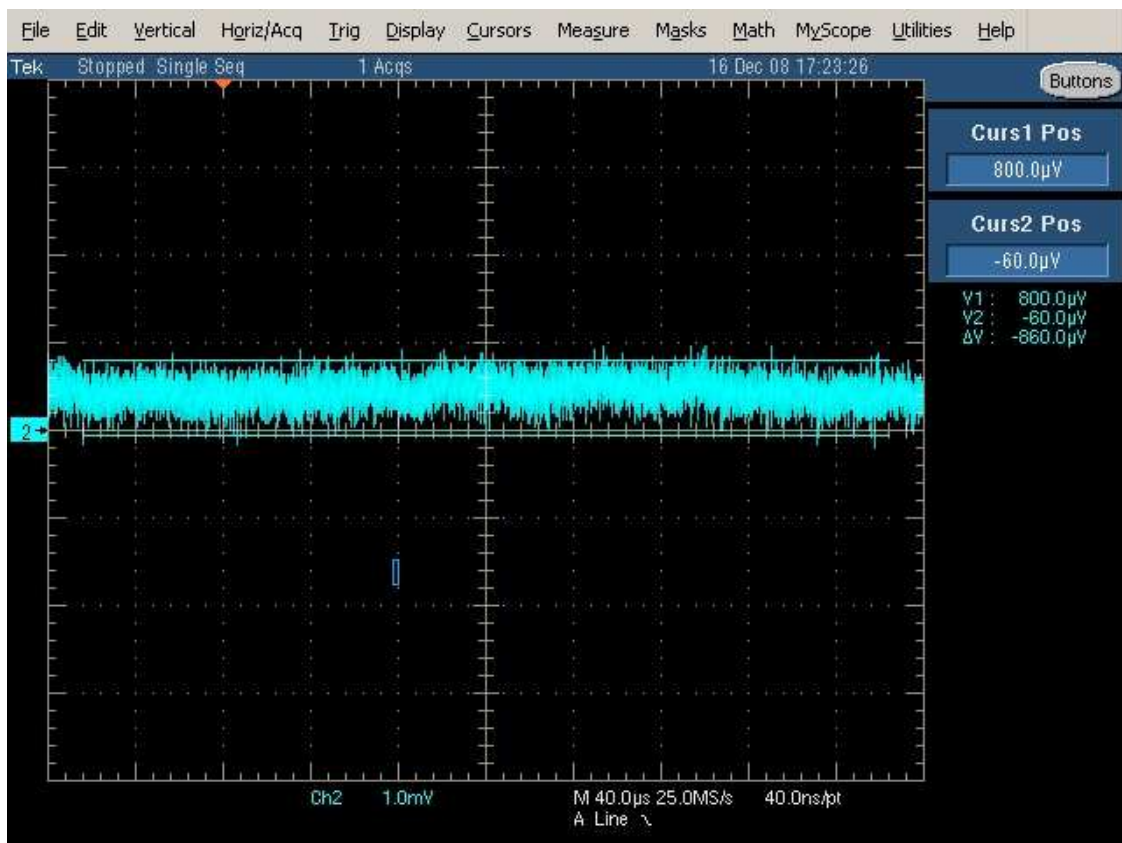


Fig. 13: Output of PrM electronics without HV conditioning when powered by modified Droege at 500V.

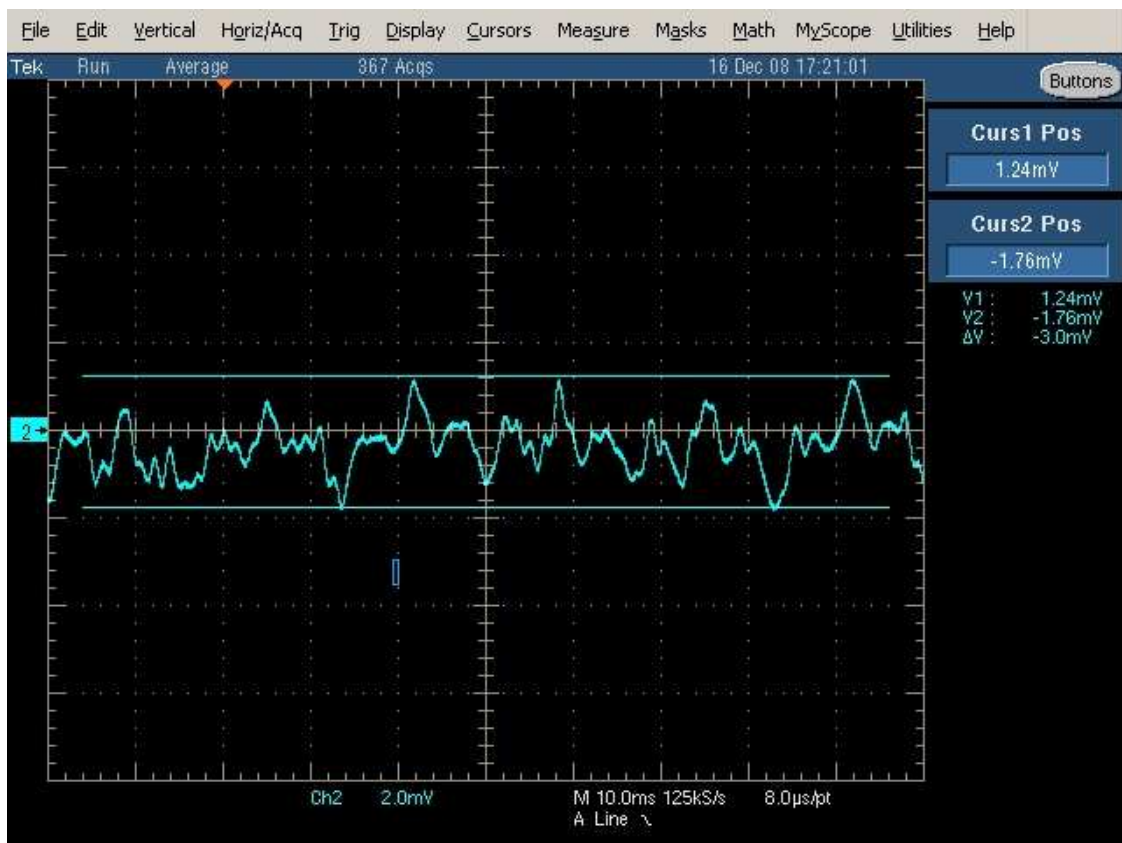


Fig. 14: Output of PrM electronics without HV conditioning when powered by modified Droege at 500V.

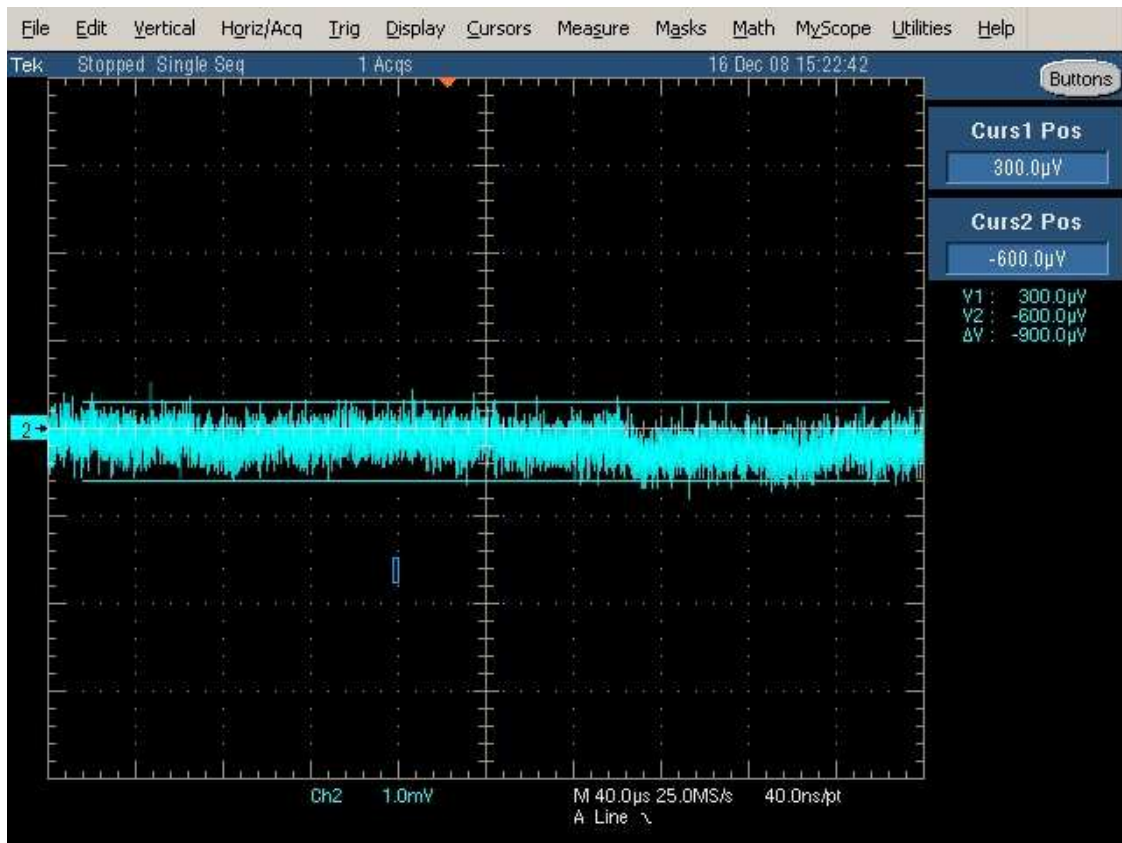


Fig. 15: Output of PrM electronics without HV conditioning when powered by modified Droege at 100V.

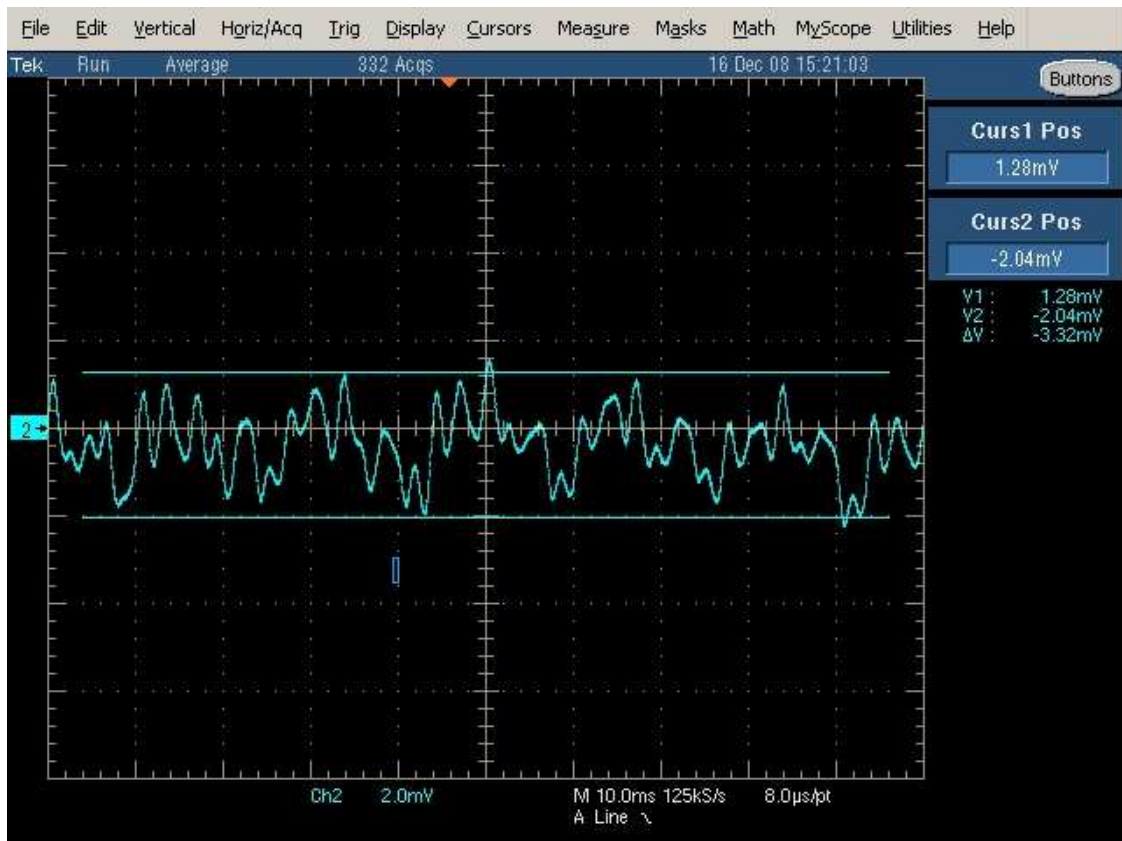


Fig. 16: Output of PrM electronics without HV conditioning when powered by modified Droege at 100V.

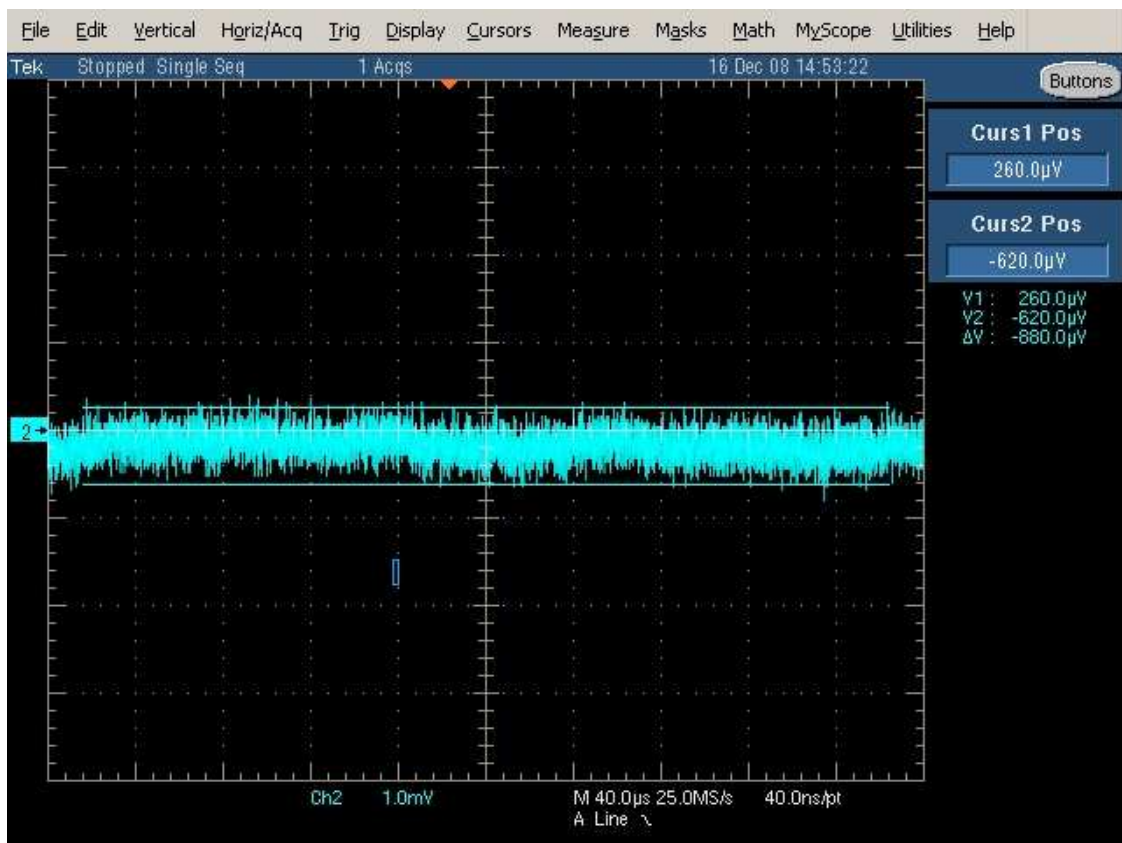


Fig. 17: Output of PrM electronics without HV conditioning when powered by modified Droege switched OFF.

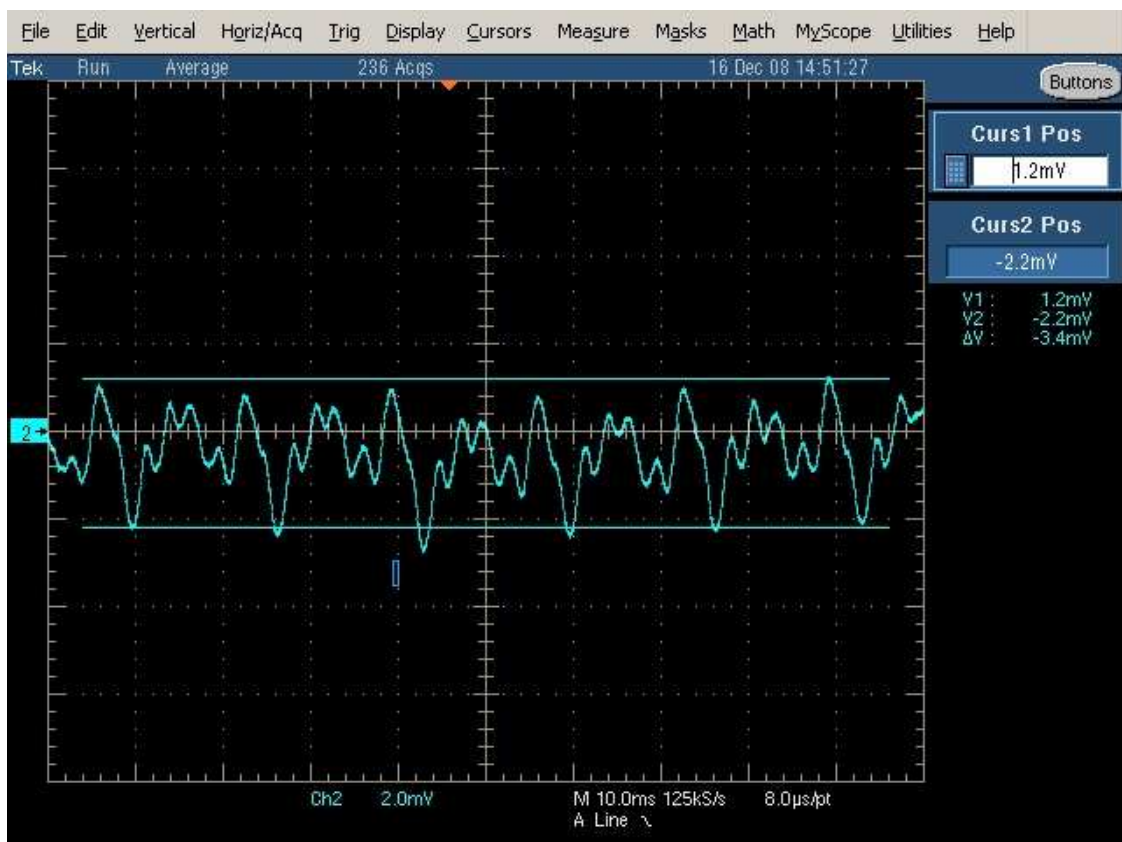


Fig. 18: Output of PrM electronics without HV conditioning when powered by modified Droege switched OFF.